

Rev.MVZ Córdoba 18(2):3437-3438, 2013.

## EDITORIAL

# Emerging zoonosis of a novel avian influenza A (H7N9) Virus. Are we prepared in the neotropics?

## Zoonosis emergente por un nuevo virus de influenza aviar (H7N9). ¿Estamos preparados en el neotrópico?

Zoonotic diseases represents a 78% of emerging and reemerging diseases, virus has an important proportion in zoonosis. We are not amazing anymore, we frequently see new virus that suddenly appears producing high morbidity and mortality, and all of them have non-specific treatment to try stopping them. The entire recent virus that came to our modern societies, were original from animals.

The first human infections with a novel avian influenza A (H7N9) virus were described in China in March 2013 (1-3). The virus was detected in poultry (1-3). Many of the people infected (77%) with H7N9 have been reported to have contact with poultry. While mild illness in human cases has been seen, most patients have had severe respiratory illness and some people have died. No cases of H7N9 outside of China have been reported yet. The new H7N9 virus has not been detected in people or birds in the neotropics (1-3).

Human infections with avian influenza occur most commonly after exposure to infected poultry (1-3). Limited person-to-person spread of bird flu is believed to have occurred rarely in the past, most notably with avian influenza A (H5N1). Based on this previous experience with avian influenza A (H5N1), some limited human-to-human spread of this H7N9 virus would not be surprising. Most important, however, is that this transmission not be sustained (1-3).

Another feature interesting of H7N9, is the capability of replicated well in eggs, something not unusual for an avian influenza virus, this allow preparing antigens and a possible candidate vaccines (1). Investigation is going on at CDC to find out about how the virus produces disease and it's expected to propagate among humans. Findings by using cell cultures and animals models will stipulate information about the difficulty of associated disease, as well as the pathology of the infection (1). Additionally, animal models are used to conduct studies on how the virus spreads. So far these studies, have confirmed that this virus spreads between animals through close contact, which was expected. Studies to conclude whether this virus can be spread in respiratory droplets through the air are continuing (4).

Close contacts of confirmed H7N9 patients are being followed to determine whether any human-to-human spread of H7N9 is occurring. No sustained person-to-person spread of the H7N9 virus has been found at this time. However, influenza viruses constantly change (5) and it is possible that this virus could become able to easily and sustainably spread between people, triggering a pandemic.

CDC lately established a diagnostic test before receiving the H7N9 virus isolates using posted genetic sequences on GISAID (1). The novel virus isolate was used to corroborate the sensitivity and specificity of the test. The test has been approved only for consuming in the United States (6).

Regarding the treatment, the H7N9 virus isolated from China seems to be susceptible to the influenza antiviral drugs oseltamivir/tamiflu® and zanamivir/Relenza® (1,5). Laboratory examination at CDC implies that this first virus received on April 2013 was susceptible to neuraminidase inhibitors, the two antiviral drugs presently proposed to treat seasonal flu. Analysis shown the virus would be resistant to the adamantanes, another class of antiviral drugs that are not presently advised for use because the possibility of widespread resistance (1,2).

It is imperative to observe that influenza viruses can become rapidly resistant to influenza antiviral drugs, and if this happens, these drugs may not be fully efficient (1,2). The H7N9 virus identified in China is a new virus and there is a lot to discover about its properties. Furthermore, the virus is still changing (5). While certain mild illness has been informed in H7N9 patients, most have had very severe illness. China is reportedly treating H7N9 cases and commending treatment of their symptomatic contacts with oseltamivir.

Since this H7N9 virus is a novel influenza virus with pandemic prospective, the source of the human infections and how this virus spreads is being judiciously studied (2,7). While the research is on going, the current working supposition is that 77% of the people have been infected with the virus after having contact with infected poultry or spoiled environments (2).

China is leading follow-up surveys among close contacts of people infected with H7N9 virus to try to evaluate whether any human-to-human dissemination is happening. According to the Chinese authors (2), more than 1,200 close contacts of the first 82 H7N9 patients were followed for 7 days to see whether they would develop symptoms. While some people have developed flu-like symptoms, all tested negative for H7N9 (2). However, the Chinese article (2) also reports on two small clusters of cases where human-to-human spread could not be ruled out, but it is possible there may have been other animal exposures in those cases as well. The results of China's investigations to date suggest that if any human-to-human transmission is taking place.

Human infections with avian influenza viruses are rare and most often occur after people are in direct or very close contact with an infected bird or environments contaminated with avian flu virus. The extent of the H7N9 avian outbreak in poultry is still being assessed, but China has reportedly begun culling birds in live markets. Infected birds can shed a lot of flu virus, for example, in their droppings or their mucus. If someone touches an infected bird or an environment contaminated with virus and then touches their eyes, nose or mouth, they may be infected with bird flu virus. There is some evidence that infection may also occur if the flu virus becomes airborne, such as when an infected bird flaps its wings.

On May 2013, the incidence of the disease was fell down brusquely, so far, 137 cases have been notified with a lethality of 28% (8). The dramatically reduction in the human H7N9 cases might have occasioned from containment actions engaged by Chinese authorities, that involving closing live bird markets (7). It is also likely the warm season interrupt the cycle of the virus, because avian influenza viruses have a seasonal pattern (7), perhaps in 2014, when the cold weather returns to China, we shall see new cases.

Finally, we do not know what is going to happen in Latin-American, but the situation is concerned because in the neotropics migratory birds can easily reach our landscapes and spread the virus to domestic and autonomous birds. Here in the neotropics will be more clearly to spread for the tropics climate conditions. So far, in Colombia we are no really prepared to face this zoonotic disease.

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